

## **NRAO/Socorro Colloquium Series: 20 April 2001**

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### **New frontiers in astrometry: the Space Interferometry Mission**

The Space Interferometry Mission (SIM) will be the first space-based optical interferometer designed for precision astrometry. It will surpass existing and planned ground-based astrometric instruments by a large factor, and will open up a new era of space-based astrometry. SIM's flexible scheduling allows it to measure precise positions of stars as faint as 20 magnitude. By observing relative to a grid of stars over the whole sky, SIM is expected to yield 4 microarcsecond absolute position and parallax measurements.

The SIM Science Team was recently selected by NASA to observe programs addressing a wide range of important science questions, including searches for low-mass planets, the formation and dynamics of our Galaxy, calibration of the cosmic distance scale, and fundamental stellar astrophysics. Understanding planetary systems is one of SIM's Key Science projects. It will perform sensitive searches for sub-stellar and planetary companions to nearby stars, by detecting the well-known astrometric 'wobble' signature. With a single-measurement precision of 1 microarcsecond in a local reference frame, SIM will be sensitive to rocky planets around nearby stars, and will approach an Earth mass sensitivity for the closest stars. It will also survey more than 1000 nearby stars for 'solar system analogs'.

As well as enabling forefront astronomical science, SIM will lead the way for future missions in NASA's Origins Program, such as the Terrestrial Planet Finder. Launch is currently planned for 2008, with a mission duration of 5 years.